

Applicants : Per Stobbe and Udo Hack
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The listing of the claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Please amend claims 1-21.

Please add claims 22-27 as follows:

1. (currently amended) A method for the production of a porous ceramic body, especially of a filter membrane, comprising the following steps:

A) Selecting of a first ceramic powder (coarse grain) with a first grain size class, wherein the first ceramic powder substantially comprises α -SiC grains aside from unavoidable contaminants;

B) Selecting of a second ceramic powder (fine grain) with a second grain size class, which that is substantially far smaller than the first grain size class, wherein the second ceramic powder substantially comprises α -SiC grains, are essentially exclusively used, aside from unavoidable contaminants, as ceramic grains for both the first and the second ceramic powder;

C) Mixing of the first and second two ceramic powders to produce a powder with a bimodal grain size distribution; and

shaping of a molded body from the powder mixture; as well as

D) Heating and conditioning of the molded body at a temperature and for a period of time such that, through recrystallization of the molded body, the grains with the second grain size are dissolved and, through attachment of the material of the second ceramic grains to the first ceramic grains, these are firmly linked to each other; and

E) Layer-wise repeating of stages A) to D) said selecting first and second ceramic powders, said mixing of the first and second ceramic powders, said shaping of a molded body, and said heating and conditioning with ceramic powders of different grain sizes, especially ever decreasing mean grain sizes, such that a gradient with regard to the mean grain size is created transverse to the layers in the ceramic body.

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2. (currently amended) ~~The Method of claim 1, characterized by the fact that~~ wherein at least one chosen from the grains of the first ceramic powder and/or the second ceramic powders have at least one chosen from a defined maximum grain size and/or a defined minimum grain size.

3. (currently amended) ~~The Method of claims 1 or 2 characterized by the fact that in method step C),~~ wherein mixing of the first and second ceramic powders comprises the ceramic powders being present in a slurry, and wherein said shaping of a molded body is effected by casting.

4. (currently amended) ~~The Method of claim 1 any of the previous claims characterized by the fact that~~ prior to method step D), including a drying the molded body prior to said heating and conditioning step occurs.

5. (currently amended) ~~The Method of claim 1 any of the previous claims characterized by the fact that,~~ wherein the mixing ratio between the first and second ceramic powder (coarse grain/fine grain) lies in the range of approximately 6:1 to 1:1, preferably 4:1 to 2:1.

6. (currently amended) ~~The Method of claim 1 any of the previous claims characterized by the fact that,~~ wherein the size ratio between the mean grain size or of the smallest grains of the first ceramic powder and the mean grain size of the largest grains of the second ceramic powder (coarse grain/fine grain) lies in the range of approximately 6:1 to 2:1, preferably 3:1.

7. (currently amended) ~~The Method of claim 1, any of the previous claims characterized by the fact that~~ wherein batches of narrow grain size distribution are used for the first and second ceramic grains.

8. (currently amended) ~~The Method of claim 1, any of the previous claims characterized by the fact that~~ wherein grain bands or grain mixtures having defined upper and lower grain size are used not only for the first ceramic grains, but also and grain bands or grain mixtures

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having a defined upper grain limit are used for the second ceramic grains, with the size ratio between the finest grain fraction of the first ceramic grains and the largest grain fraction of the second ceramic grains chosen to be at least 2:1.

9. (currently amended) ~~The Method of claim 1, any of the previous claims characterized by the fact that~~ wherein shaping of the molded body ~~in method step C)~~ proceeds on a substrate, ~~especially in pore channels of a porous ceramic body of the same material.~~

10. (currently amended) ~~The Method of claim 1, any of the previous claims characterized by the fact that~~ wherein the ceramic grains are of non-oxide ceramic and ~~especially of the same type.~~

11. (currently amended) ~~The Method of claim 1, any of the previous claims characterized by the fact that~~ wherein for a first layer, the grain sizes of the first ceramic powder are in the range of 6.5 µm (FEPA 800) to 23 µm (FEPA 360), wherein for a second layer the grain sizes of the first ceramic powder are in the range of 1.5 µm (JIS 7000) to 6.5 µm (FEPA F800), and wherein for a third layer the grain sizes of the first ceramic powder are in the range of 0.5 µm (JIS 10000) to 2 µm (JIS 6000), and wherein the second ceramic powder for the first, second, and third layers is at least one chosen from ~~with preferably JIS 6000 being used as the second ceramic powder for the first layer, JIS 9000 for the second layer, and JIS 20000 for the third layer, and or in each case equivalent grain bands for each of the first, second, and third layers.~~

12. (currently amended) ~~The Method of claim 1, any of the previous claims characterized by the fact that~~ wherein heating and conditioning comprises selecting the temperature and firing duration in method stage D) ~~is chosen~~ such that generally all ~~hardly any~~ grains of the second ceramic powder are no longer present ~~any longer~~ in the microstructure of the finished ceramic body and such that ~~at the same time~~ the grain size remains as close as possible in the region of the initial grain size of the first ceramic powder ~~and to thereby generally prohibit giant grain growth is avoided.~~

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13. (currently amended) ~~The Method of claim 1, any of the previous claims characterized by the fact that~~ wherein grain sizes in the range of 0.9 μm to 17 μm are used for the first ceramic powder and grain sizes in the range of 0.2 μm to 3 μm are used for the second ceramic powder.

14. (currently amended) ~~A Porous ceramic body, especially made in accordance with a method of any of the previous claims, said ceramic body comprising a substantially with an essentially homogeneous structure of interconnected, open pores and ceramic grains, with the said ceramic grains essentially having a substantially rounded shape, and with both the said ceramic grains and the said open pores essentially lying substantially at least in defined ranges in at least one chosen from a narrow grain size range or and a narrow pore size range, characterized by the fact that~~ wherein the defined ranges of said narrow grain size range or said narrow pore size range distribution are present as layers on a coarse-porous support or especially in pore channels of a coarse-porous support, and that the said ceramic body consists, except for unavoidable contaminants, exclusively of substantially comprises recrystallized RSiC aside from unavoidable contaminants.

15. (currently amended) ~~The Ceramic body of any of claims 13 to 14, wherein characterized by the fact that the~~ said ceramic grains are present essentially in substantially completely crystalline form.

16. (currently amended) ~~The Ceramic body of any of claims 11 to 15~~ 14, wherein characterized by the fact that the said ceramic body is essentially substantially free of melt phase.

17. (currently amended) ~~The Ceramic body of any of claims 11 to 16~~ 14, wherein characterized by the fact that the said ceramic grains are of non-oxide ceramic and especially substantially of the same type.

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18. (currently amended) ~~The C~~ceramic body of any of claims ~~11 to 15~~ 14, wherein said ceramic body ~~characterized by the fact that~~ it has adequate strength for use as a filter membrane, ~~especially in a cross-flow membrane filter.~~

19. (currently amended) ~~A~~Filter, ~~especially cross-flow membrane filter,~~ said filter comprising with a ceramic body of any of the previous product claims, especially an SiC membrane, on a SiC coarse-porous support, said ceramic body including at least one layer, said at least one layer including, especially SiC support, preferably made by any of the previous method claims.

a first ceramic powder, said first ceramic powder substantially comprising SiC and having a first grain size, and

a second ceramic powder, said second ceramic powder substantially comprising SiC and having a second grain size, said second grain size being substantially smaller than said first grain size,

wherein via recrystallization said second ceramic powder is dissolved and attached to said first ceramic powder such that said second ceramic powder is firmly linked to said first ceramic powder, and wherein said ceramic body comprises a substantially homogenous structure of interconnected open pores and ceramic grains with said ceramic grains having a substantially rounded shape, and wherein said ceramic grains and said open pores lie substantially in defined ranges in at least one chosen from a narrow grain size range and a narrow pore size range.

20. (currently amended) ~~The F~~filter of claim 19, ~~said filter characterized by the fact that it exhibitings, with a double-layer membrane at 1 bar TMP in the test on water, a flow greater than 5, preferably 6, especially 8 m³ per m² per bar per hour when said ceramic body includes two layers, and or, with a three-layer membrane, greater than 3, preferably 4, especially 6 m³ per m² per bar per hour~~ when said ceramic body includes three layers.

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21. (currently amended) The Ffilter of claim 19 ~~or 20, characterized by the fact that wherein~~
said the filter furthermore comprises a layer of porous oxide ceramic, ~~especially adapted~~ for
nanofiltration.

22. (new) The method of claim 1, wherein said layer-wide repeating comprises ceramic
powders of ever-decreasing mean grain sizes such that a gradient with regard to the mean
grain size is created transverse to the layers in the ceramic body.

23. (new) The method of claim 5, wherein the mixing ratio between the first and second
ceramic powder lies in the range of approximately 4:1 to 2:1.

24. (new) The method of claim 6, wherein the size ratio between the mean grain size of the
smallest grains of the first ceramic powder and the mean grain size of the largest grains of the
second ceramic powder is approximately 3:1.

25. (new) The method of claim 9, wherein the substrate comprises a porous ceramic body of
the same material, and wherein shaping of the molded body proceeds in pore channels of the
substrate.

26. (new) The ceramic body of claim 14, wherein said layers on said coarse-porous support
are present in pore channels of said coarse-porous support.

27. (new) The ceramic body of claim 18, wherein said ceramic body has adequate strength for
use as a cross-flow membrane filter.

28. (new) The filter of claim 20, wherein said filter exhibits a flow of approximately 8 m^3 per
 m^2 per bar per hour when said ceramic body includes two layers, and wherein said filter
exhibits a flow of approximately 6 m^3 per m^2 per bar per hour when said ceramic body
includes three layers.